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ABSTRACT

This study is concerned with the effect of involving small groups in team research work in a large psychology class at Illinois State University. Phase I (fall) dealt with developing, organizing, and evaluating a lab team method and sought to have students actively participate in discussion of study questions and in team research by combining a small interaction group approach one day a week with the traditional large lecture twice a week. Based on the results of the fall semester, Phase II (spring) incorporated several stated changes in the course and emphasized an improved lab team method. Phase II data offered the opportunity to explore the kind of students elected as team leaders and the relationship of team and leader variables to the students' final rating of their laboratory team experience. Course achievement, leader power, group cohesion, individual team members' contributions, course ratings, and lab team aspects were measured by various quizzes; exams; sociograms; and rating scales. Findings indicate that lab teams tend to elect female leaders who are relatively high achievers in psychology. School level or previous high school psychology had no effect on the selection of leaders. Three variables seemed to be positively correlated with group ratings of their team experience: the leader's final exam score, the team cohesion ratio, and the final evaluation of the whole course. (SJM)

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LABORATORY TEAM LEADERS IN A GENERAL PSYCHOLOGY CLASS

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Purpose of Laboratory Teams

General Psychology at Illinois State University is usually taught in large auditoriums which seat about 350 freshmen. As in most large universities, the teaching method is predominately lecture and the evaluation mode the multiple-choice examination. Although we carry on some informal discussions, the per cent of students who actively participate is necessarily low, and true sociometric interaction is almost nil.

Our earlier studies have shown that small teacherless groups of students could learn effectively by discussing lists of study questions which highlight the important concepts in the text (Gnagey, 1963). We also have found that students prefer some aspects of large auditorium sections as well as some activities in smaller groups (Gnagey *et al.*, 1968). It was our plan to combine these assets by retaining some lecturing while involving smaller groups in team research ventures which would give them an opportunity to "do psychology."

Phase I: Developing the Lab Team Method

Procedure

In the fall semester of 1972, my general psychology class consisted of 250 freshmen and sophomores who met Monday, Wednesday and Friday at 3:00 p.m. in a huge lecture hall. The first day was spent introducing the course and explaining the procedures outlined on the course description sheet. Each student filled out a 3" x 5" card with his name, I.D. number, home town, campus address and phone.

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Using these data, we organized 31 laboratory teams which were balanced for the sexes and made up of students from the same campus residence areas. Five of these teams were composed of off-campus students.

About a week later, the team functions and operation were described and the names of each team were called off. The youngest person in each team convened the group outside long enough to make a list of all present and select a tentative meeting site. Most of these turned out to be dormitory social rooms and lounges. We discovered that such places were rarely used by others during the day.

Thereafter, the teams met every Wednesday during the regular class time. Their functions were: (1) the production of four research projects; and (2) the discussion of elements of the text. After each team meeting, the leader (elected by the group and "paid" ten extra credits for taking the responsibilities) submitted a report which contained: (1) a list of members present; (2) a brief summary of the meeting; (3) a list of questions or problems that needed the instructor's attention. Periodically, we met with the team leaders to talk over problems that arose. At mid-semester, we held a re-election, but most team leaders were retained by their groups for the second half.

The lecture on Monday was usually introductory, and Friday focused upon the problems listed by the teams in their Wednesday meetings. Each team leader was provided with a set of study questions defining the objectives for each chapter. Most teams also purchased a copy of a commercial laboratory manual as a source of ideas for their research projects. Before a team carried out a research study, they wrote a proposal which we read and handed back with suggestions. Teams received 25 credits for

each lab study accepted. They were allowed to rewrite studies that were below standard.

Evaluation

To measure their ability to recognize and apply psychological concepts, four multiple-choice unit examinations and a final were administered. A portion of each measured comprehension of the experimental process.

To measure student perception of the innovations, the Final Course Rating Scale (see Appendix, p. 16) was administered by each team leader to his team. The leader indicated his own response by an asterisk.

In addition, each team leader filled out a final lab group report in which he: (1) listed the research topics completed, (2) rated the contribution of each of his team members, (3) rated the effectiveness of the lab team activity, (4) rated the effect on him of being a leader, and (5) listed constructive suggestions.

Results

Table 1 shows the results of the objective examinations. Curricular validity was assured by using the study questions as guides for the selection of test items. KR_{21} reliability was quite high for each examination.

TABLE 1

ANALYSIS OF FOUR ACHIEVEMENT TESTS

	# of Items	Mean	S.D.	KR_{21}
1	60	41.0	9.9	.88
2	60	38.7	8.8	.83
3	60	45.5	9.1	.88
4	120	75.1	16.2	.90

A summary of the University Course Rating Scale results showed that the modal ratings were the same for team leaders and members in all but

one case. The leaders claimed to be more interested and motivated (Item 6) than their members.

A summary of the team leaders' final lab group reports supported, in general, the data on the rating scale.

It was found that the lab teams composed of off-campus students were not functioning well and produced an outlandish proportion of the failing grades on the first two exams.

Although attendance was not required, it became so sporadic that important announcements were missed by many students.

Phase II: The Improved Team Method

Class Characteristics

In the spring of 1972, our general psychology class consisted of 319 students who were scheduled to meet in an identical auditorium on Monday, Wednesday and Friday at 1:00 p.m. Table 2 shows the composition of the class in terms of sex and year in school.

TABLE 2

ANALYSIS OF SUBJECTS BY SEX AND YEAR IN SCHOOL

	Year in School						
Sex	Fr.	So.	Jr.	Sr.	Grad.	Und.	Total
M	96	25	8	1	0	4	134
F	142	9	3	0	0	31	185
Total	238	34	11	1	0	35	319

Incidentally, 59 of the 319 had had some kind of psychology course in the high school.

The Improved Procedure

Based on the results of our fall semester, we believed that several changes in operation might improve the effectiveness of the course. The

following variations in method were, therefore, put into effect in the spring of 1972:

1. Essay-type study guides for each chapter were made available to every student instead of to team leaders exclusively as in Phase I. They were handed out on Monday of each week.

2. Lectures were organized around the study questions instead of being introductory or remedial as in Phase I.

3. Two team laboratory projects were assigned instead of four as in Phase I. A proposal outline was supplied to each team leader beforehand so as to minimize rewrites.

4. Bonus points were awarded to students whose team leader rated their contribution to the research projects as average, good or excellent. This was an attempt to secure better participation on the team projects. Team leaders were awarded bonus points (over and above their flat rate of 10) on the basis of their ratings on the group sociogram. This was to compensate leaders who may have assumed more than their share of responsibility.

5. Students who lived off campus were randomly assigned to teams who lived in dorms. This alleviated the problem of 10 people trying to meet in a small apartment some distance from the campus as was the case in Phase I.

6. A 15-item chapter quiz was administered in alternate forms each Friday in an attempt to raise the level of motivation and preparation. These took the place of the three unit tests used in Phase I but kept the number of items constant. A tear-off feedback sheet was provided so that each student could make a copy of his answers. Key cards were available just outside the lecture hall so each student could check his quiz immediately after handing it in. The key cards contained the answers, the numbers of the study questions to which each item referred, and the text page on which the topic could be found.

Results

Table 3 shows the results of the 13 quizzes and the final. The KR_{21} reliability quotient for the final exam was .91.

TABLE 3

MEANS AND STANDARD DEVIATIONS FOR FOURTEEN ACHIEVEMENT TESTS

Quiz	Mean	S.D.
1	10.6	2.3
2	9.8	2.6
3	10.4	2.8
4	11.1	2.3
5	10.5	2.3
6	10.2	2.4
7	12.1	1.8
8	9.2	2.4
9	12.3	1.8
10	10.1	2.4
11	11.0	2.0
12	10.1	2.4
13	10.7	2.2
Final Exam	69.5	17.8

The results of the Final Course Rating Scale (see Appendix, p. 16) are reported on a 5-point scale: 1 = never; 2 = seldom; 3 = sometimes; 4 = usually; 5 = always.

The highest mean ratings were awarded to "clarity of objectives" (4.02) and "adequate feedback" (4.4). "Fairness of grades" followed next (3.9) with evaluations of "the text" (3.6) and the "measurement devices" (3.6) sharing the next spot.

In general, none of the mean ratings slipped much below 3. The lowest, however, was the one rating the helpfulness of the laboratory team (2.7).

Comparison to Phase I

As often happens in developmental studies, the measuring devices are improved along with other changes in method. While these may be necessary, it makes comparisons extremely difficult. Some of these follow, nevertheless.

Examination Data. In order to make this comparison, the data from four weekly Phase II quizzes were combined.

Table 4 indicates no improvement in the total learning of psychology subject matter as measured by quizzes and examinations. In fact, retention seems slightly poorer, if anything, for Phase II.

TABLE 4

COMPARISON OF PHASE I AND II MEAN TEST SCORES

	# of Items	Mean Score	
		Phase I	Phase II
1	60	41.0	41.9
2	60	38.7	42.0
3	60	45.5	43.5
4	120	75.1	69.5
Total		200.3	196.9

Student Course Evaluation. Although the final course rating scale in Phase II made use of a 5-point rating instead of a 3-point scale as in Phase I, their comparative ranks are instructive (see Table 5).

TABLE 5

COMPARISON OF FINAL COURSE RATINGS, PHASES I AND II, BY RANK

Criterion	Rank of Mean Rating	
	Phase I	Phase II
Clarity of objectives	1.5	2.0
Text	4.0	4.5
Lectures	7.5	6.5
Feedback	1.5	1.0*
Measurement devices	5.0	4.5
Interest in course	6.0	6.5
Fairness of grades	3.0	3.0
Lab teams	7.5	8.0

*Rank of 1 indicates a high rating.

Only one rating changes its comparative position more than half a rank. Students rated the lectures lower in Phase II than in Phase I.

Non-Contributing Team Members. One potentially serious problem concerns lab team members who don't contribute to the group projects but still receive credit for what the group does. During Phase I, 10 out of 200 (10%) team members were rated by their leaders as "excessively absent, should not get full credit." In the Phase II tally, only 20 of 289 (7%) rated this low.

Advisability of Lab Teams. In both phases, we asked the team leaders whether they would "advise using lab teams again next semester." In Phase I, only 5 out of 28 reports (18%) said no, while in Phase II, 2 of 30 reports (7%) were negative. While this appears to be quite an improvement, it should be remembered that the opinion of the team leaders may be quite different from those of the other members.

Satisfaction of Team Leaders. Team leaders were asked, "If you had it to do over, would you accept the position of team leader?" At the end of Phase I, 3 of 28 reporting (11%) said no. Only 1 of 28 leaders reporting in Phase II (4%) answered in the negative. There appears to be a great deal of improvement in leader satisfaction in the second phase.

Conclusions

Indications are that the changes made in this approach for the second semester had the following effects:

1. Retention of the subject matter of the course may have been slightly worse during Phase II. My own belief is that the final was more difficult since I used only items with high discrimination ratios. These were also the high-difficulty items in many cases.

2. According to the students' ratings, my lectures were no better in Phase II (in comparison to other aspects of the course) than they were in the initial phase. In fact, they

dropped a rank. The item in the Phase I rating scale used the term "lecture hall activities," while the Phase II item said "lectures." Several excellent films were used in Phase I that were not available for Phase II.

3. The rate of non-contributing team members appeared to be about the same in both semesters. Next time, I shall announce the possibility of bonus points for high participation and show team leaders how to secure involvement.

4. Team leaders seemed more convinced of the adequacy of lab teams this semester than last. Reducing the number of projects from 4 to 2 may have contributed to this.

5. Team leader satisfaction seemed to be considerably higher this semester than last. This at least confirms our Phase I indications that the lab team experience has a positive effect on the leaders.

Phase III: Teams and Their Leaders

In addition to helping us further evaluate and improve our laboratory team method, the data we collected in Phase II offered the opportunity to begin to answer two general questions about its dynamic underpinnings: (1) What kind of students are elected as team leaders?, and (2) What team and leader variables are related to the students' final rating of their laboratory team experience?

Objectives

Specifically, we wanted to see if elected team leaders differed systematically from their classmates in sex, year in school, high school psychology courses, and achievement in the course. Logically, one might expect team members to cast their votes for older students with strong psychology backgrounds and superior understanding of the course content.

In addition, we were interested in the relationships between the groups' final rating of their laboratory team experience and several other variables including the leaders' achievement, power, and evaluation of his team members' contribution to the laboratory projects. We were

also curious as to the relationships between the same final laboratory team experience evaluation and group achievement, cohesion, and final evaluation of the whole course.

Measurement

Course achievement was measured by 12 15-item, multiple-choice quizzes and one 120-item, multiple-choice final. All items referred to study questions that were handed to students at the beginning of each chapter.

Leader power was measured by a sociogram (see Appendix, p. 17) in which each student listed the three members of his group he would "take along" if new teams were to be formed. A leader's power ratio was computed by dividing the number of sociometric choices he got by the number of team members who completed the sociogram.

Group cohesion was measured by asking each student to check whether he would elect to spend the remainder of the semester with the same or another team. A team cohesion ratio was computed by dividing the number of members marking "same" by the total members who responded.

Each team member's contribution was rated on a 5-point scale by the team leader. A mean contribution rating was computed as a measure of the leader's perception of his team's effectiveness.

The course was evaluated at the end of the semester by an 8-item, 5-choice rating scale. Mean course evaluations were computed for each team.

The laboratory team aspect of the course was also rated separately by a 5-choice rating scale item which accompanied the sociogram (see Appendix, p. 17). Means were computed for each team.

Results

Chi-square analysis showed that a significantly higher proportion of women were elected team leaders than we would expect from the sex composition of the class (see Table 6).

TABLE 6

CHI-SQUARE COMPARISON OF LEADERS AND NON-LEADERS BY SEX

	Leaders	Non-Leaders	Totals
Men	7	127	134
Women	22	163	185
Totals	29	290	319

$\chi^2 = 4.18$, $p. < .05$

A similar analysis, however, showed no such difference in the proportion of freshmen and non-freshmen (see Table 7).

TABLE 7

CHI-SQUARE COMPARISON OF LEADERS AND NON-LEADERS BY YEAR IN SCHOOL

	Leaders	Non-Leaders	Totals
Freshmen	23	216	239
Non-freshmen	6	74	80
Totals	29	290	319

$\chi^2 = .327$, $p. > .10$

When we compared the proportion of leaders and non-leaders who had taken psychology in high school, no difference appeared (see Table 8).

TABLE 8

CHI-SQUARE COMPARISON OF LEADERS AND NON-LEADERS FOR HIGH SCHOOL PSYCHOLOGY

	Leaders	Non-Leaders	Totals
Psychology	5	55	60
No psychology	24	235	259
Totals	29	290	319

$\chi^2 = .05$, p. > .10

A comparison of the mean test scores of team leaders with those of a random sample of 50 non-leaders showed that in every case, the team leaders scored higher. Since the data included 13 quizzes and a final examination, a sign test revealed that the difference was significant at better than the .01 level (see Table 9).

TABLE 9

SIGN TEST COMPARISON OF LEADERS AND NON-LEADERS ON FOURTEEN MEAN ACHIEVEMENT TEST SCORES

Quiz	Non-Leaders (Random 50)	Team Leaders (N = 29)	Sign
1	10.6	11.0	+
2	9.8	11.0	+
3	10.4	10.8	+
4	11.1	11.3	+
5	10.5	11.5	+
6	10.2	11.5	+
7	12.1	12.8	+
8	9.2	10.6	+
9	12.3	12.9	+
10	10.1	11.8	+
11	11.0	11.5	+
12	10.1	11.8	+
13	10.7	11.9	+
Final	69.5	80.5	+

T = 0, N = 14, p. < .01

Table 10 shows the product-moment correlation coefficients we computed in order to get a picture of the relationships between the group evaluations of their team experience and several other variables. Significant positive relationships were found between the final team experience ratings and the leaders' final exam score ($r = .40$, $p. < .05$), the team cohesion ratio ($r = .72$, $p. < .01$), and the final course evaluation ($r = .45$, $p. < .05$). In addition, a significant positive relationship ($r = .46$, $p. < .05$) was found between the leaders' mean quiz scores and the teams' evaluation of the whole course.

TABLE 10

PRODUCT MOMENT CORRELATION COEFFICIENTS BETWEEN GROUP EVALUATIONS OF THE LABORATORY TEAM PROCESS AND EIGHT OTHER VARIABLES

Variable	Correlation with Team Method Evaluation
1. Leader's $\bar{x}$ quiz	.30
2. Team's $\bar{x}$ quiz	.13
3. Leaders final exam	.40*
4. Team's $\bar{x}$ final exam	.17
5. Leader's power ratio	.30
6. Team cohesion ratio	.72**
7. Team contribution ratio	.18
8. Team $\bar{x}$ final course evaluation	.45*

*p. < .05
**p. < .01

Summary

Apparently, laboratory teams tend to elect female leaders who are relatively high achievers in psychology. These leaders are just as likely to be freshmen as not and are no more apt to have taken high school psychology than non-leaders.

Three variables seem to be positively correlated with group ratings of their team experience: the leader's final exam score, the team cohesion ratio and the final evaluation of the whole course.

For some reason, the leader's mean quiz score shows a positive relationship to his team's final evaluation of the whole course.

References

Gnagey, W. J. "The Comparative Effects of Small Group vs. Teacher-led Discussion Sessions Upon Student Achievement and Perception of Educational Psychology," Journal of Educational Research, 56, pp. 24-32, 1963.

Gnagey, W. J., P. M. Chesebro and James J. Johnson. "Student Evaluations of Two Methods of Presenting Educational Psychology and the Actual Effects Upon Their Achievement, Retention and Professional Attitudes," paper read before the American Psychological Association, San Francisco, September, 1968.

APPENDIX

Date _____ Course _____ Team _____

FINAL COURSE RATING SCALE

Please read each item below and record your ratings on the following scale: 1 = almost never; 2 = seldom; 3 = sometimes; 4 = usually; 5 = almost always. You may add additional comments in the space below each item.

____1. The objectives of this course were clear to me. I knew what I was expected to learn.

____2. The text helped me fulfill the course objectives. The chapters were readable, interesting and well organized.

____3. The lectures helped me fulfill the course objectives. They were informative, interesting and well organized.

____4. The feedback in this course was adequate. I knew how well I was doing.

____5. The quizzes and exams used in this course were accurate indicators of the extent to which I was fulfilling the objectives. They allowed me to show what I was learning.

____6. My interest in the course was kept high enough to motivate me to do good work. I was able to apply myself.

____7. The grades I have received for this course were fair. They were what I deserved for what I learned.

____8. The laboratory teams helped me fulfill the course objectives. Working with other students helped me understand the experimental process.

LABORATORY TEAM SOCIOGRAM

Team # _____ Year in School: F So Jr Sr

Sex M ____ F ____ GPA _____

A. If we were to reorganize the laboratory teams into smaller groups, which 3 of your team members would you like to take with you to a new group? You may refer to the attached team lists.

1. _____

2. _____

3. _____

B. If you had your choice for the remainder of the semester, which of the following would you do?

____1. Stay with my same team.

____2. Join another team.

C. Which one of the following most nearly characterizes your opinion about your own laboratory team experiences?

____1. It was a complete waste of time. I hated every minute.

____2. Once in awhile we had a worthwhile session, but most were boring.

____3. About half the time the team sessions were good. I could have done without the rest.

____4. Team sessions were usually quite good, but once in awhile they didn't come off.

____5. My lab team work was one of the highlights of the course. I think it is a great idea.